

Credit Supply in China: An Empirical Study of Listed Companies

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Issue

- In China, understanding credit supply important
 - credit availability may affect growth in a poorly developed financial system
 - used as policy instrument, sc ‘window guidance’
- Problem: credit supply is non-transparent
 - Neither status nor effect observed directly
- Can one estimate developments in credit supply in China econometrically?

Methodology

- Stochastic frontier analysis of corporate data
- First use: Chen and Wang (2008)
- Our contribution:
 - New approach links the model specification to theory.
 - Builds on my earlier work on household credit constraints.

The theoretical premise

- From Holmström and Tirole (1997), Kiyotaki and Moore (1997) and Bernanke, Gertler and Gilchrist (1998)

Consider the hypothesis, consistent with the above, that firms face quantitative credit supply constraints of the form:

$$L_{it} \leq \beta_t X_{it} + v_{it} \tag{1}$$

L=borrowing

β =credit supply parameters

X=wealth, own funds.

v=stochastic disturbance

Equilibrium analysis: three alternatives

1. Bernanke et al (1998): credit constraints are binding for none:

$$L_{it} = \alpha_t X_{it} + \epsilon_t$$



Linear regression gives credit demand function
 α =optimal debt/assets ratio

Equilibrium analysis: three alternatives

2. Kiyotaki & Moore (1997), Holmström & Tirole(1997): credit constraints are binding for all.

$$L_{it} = \beta X_{it} + v_t$$



Linear regression gives credit supply parameters

Equilibrium analysis: three alternatives

3. Holmström & Tirole(1997) intermediate case:
credit constraints are binding for some

$$L_{it} = \beta_t X_{it} + v_{it} - u_{it}$$



Stochastic frontier analysis gives credit supply parameters

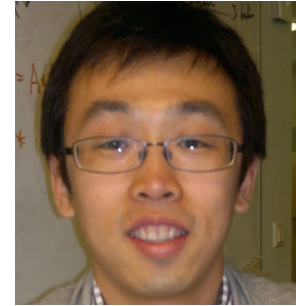
u =distance from credit supply constraint

Estimation strategy

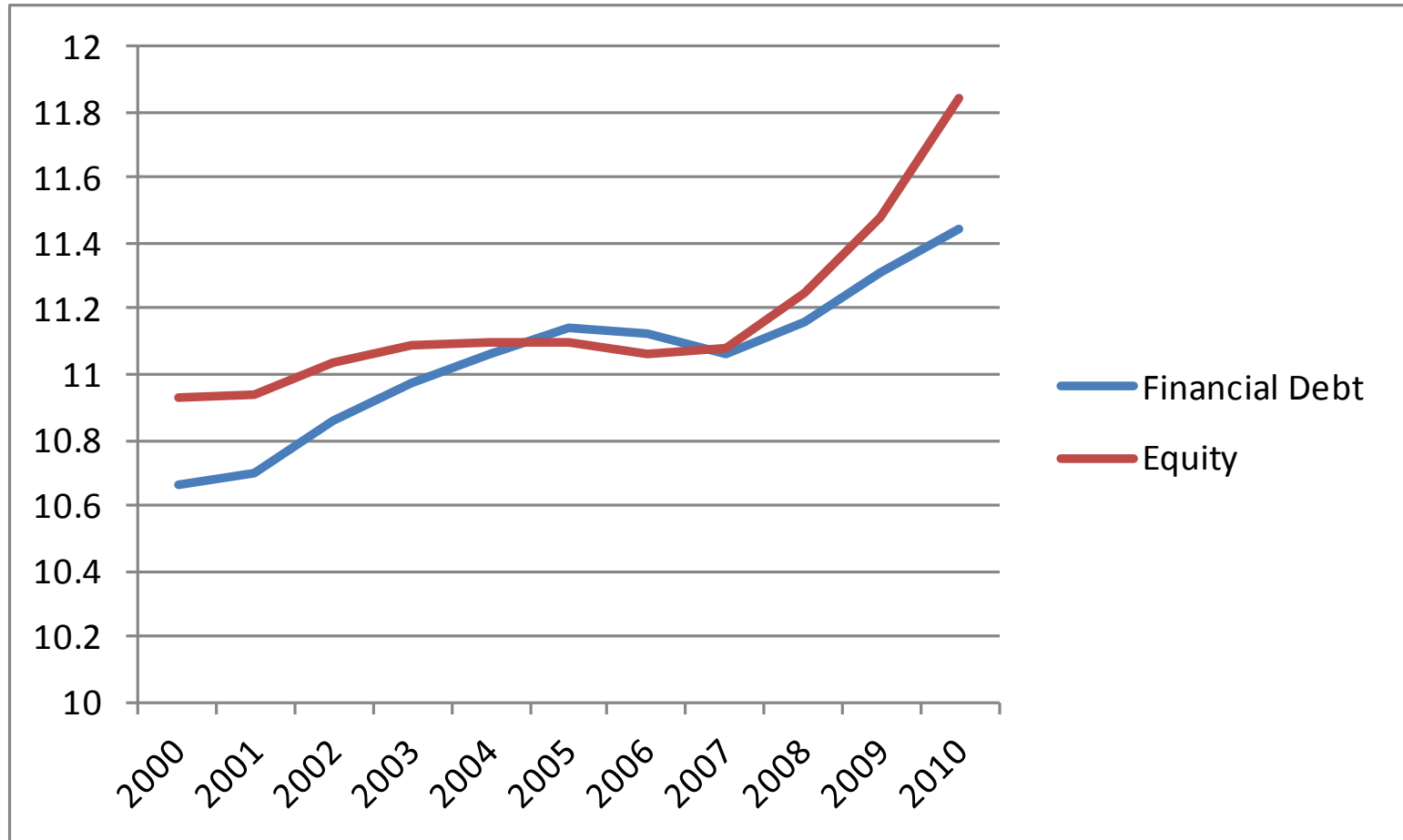
- Case (3) general, others special cases.
- Use test by Coelli (2005) to test 3 against 1 & 2
 - In case (3) skewed residuals, in cases (1) and (2) symmetric residuals
- If (3) holds, estimate credit supply parameters by SF analysis under alternative assumptions about u .
- 11 yearly estimations by cross section
 - panel estimations in the future?

Data

- public info about over 1000 Chinese listed companies, years 2000-2010.
- Data work by Yandong Jia (PBC)
 - present location: unknown
 - data public from a free source (in Chinese)

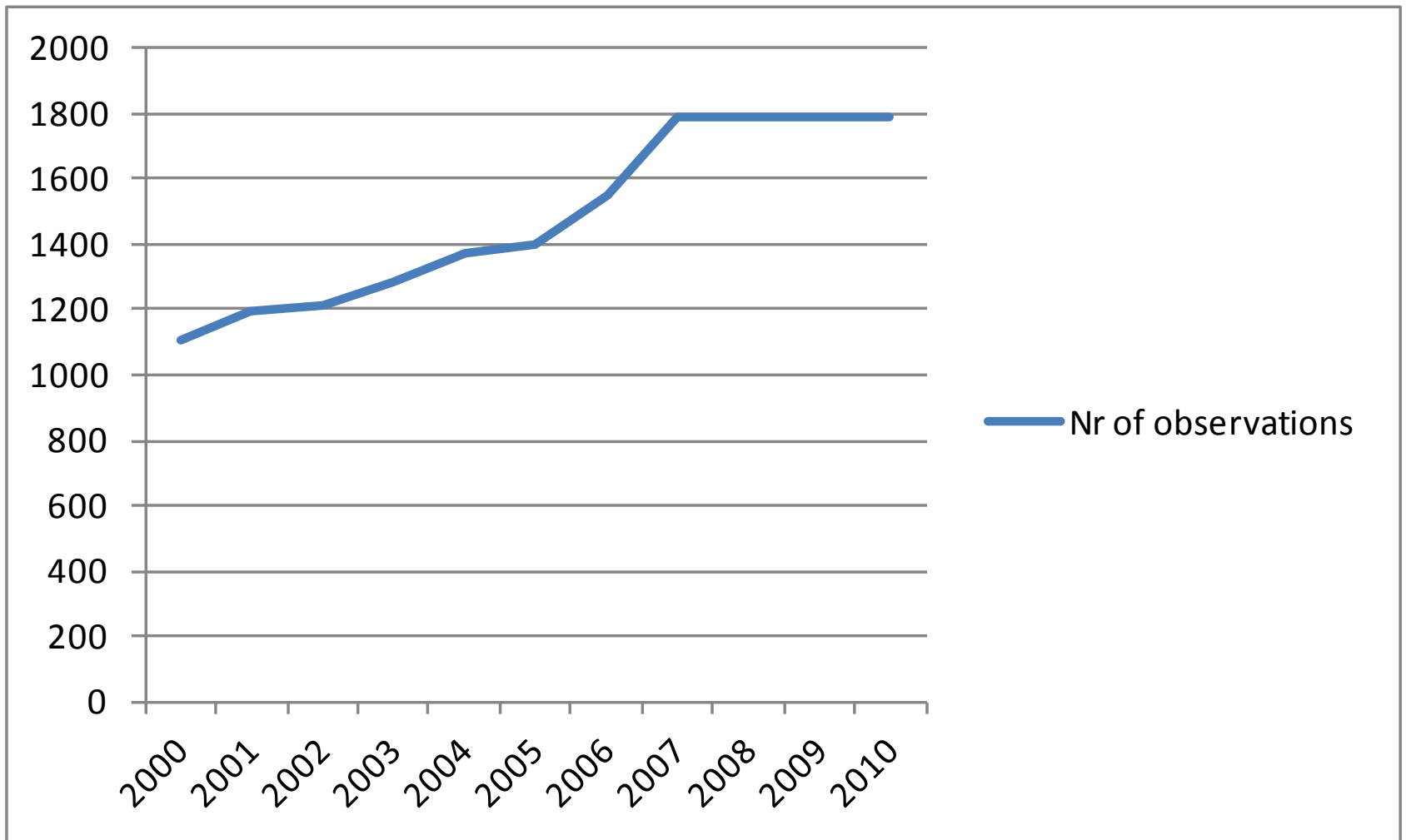


Descriptive stats



Indicator statistics

	eastern region	second industry	third industry	government owned
2000	66 %	70 %	26 %	69 %
2001	66 %	70 %	26 %	69 %
2002	66 %	70 %	26 %	69 %
2003	66 %	70 %	26 %	69 %
2004	66 %	70 %	26 %	69 %
2005	66 %	70 %	26 %	69 %
2006	66 %	70 %	26 %	69 %
2007	66 %	70 %	26 %	69 %
2008	66 %	70 %	26 %	69 %
2009	66 %	70 %	26 %	69 %
2010	66 %	70 %	26 %	69 %



Estimation results: Coelli (2005) tests

. frontier LDF LE

Iteration 0: log likelihood = -2833.1031
 Iteration 1: log likelihood = -2827.4545
 Iteration 2: log likelihood = -2827.3969
 Iteration 3: log likelihood = -2827.3969

Stoc. frontier normal/half-normal model

Number of obs = 1794
 Wald chi2(1) = 2159.49
 Prob > chi2 = 0.0000

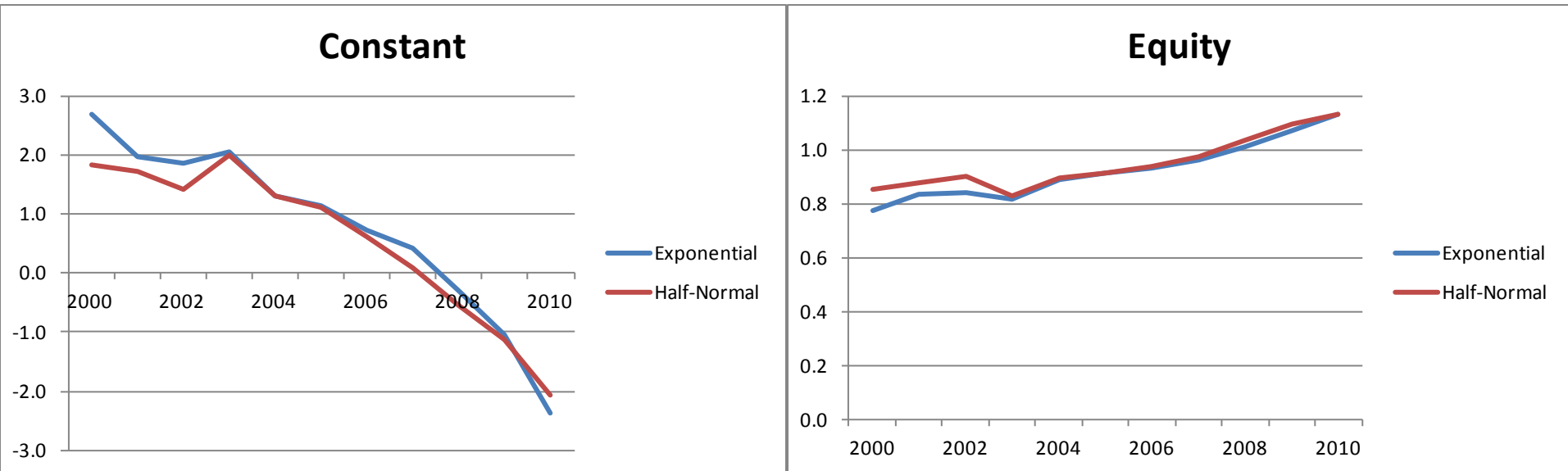
Log likelihood = -2827.3969

LDF	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
LE	1.010661	.0217485	46.47	0.000	.9680349	1.053288
_cons	.7538738	.2800242	2.69	0.007	.2050365	1.302711
/lnsig2v	-.6694182	.1063351	-6.30	0.000	-.8778313	-.4610052
/lnsig2u	.9271623	.0812531	11.41	0.000	.7679091	1.086415
sigma_v	.7155462	.0380439			.6447352	.7941344
sigma_u	1.589757	.0645863			1.468079	1.72152
sigma2	3.039334	.1702096			2.705729	3.372938
lambda	2.221739	.0957646			2.034044	2.409434

Likelihood-ratio test of sigma_u=0: chi2(01) = 79.20 Prob>=chi2 = 0.000

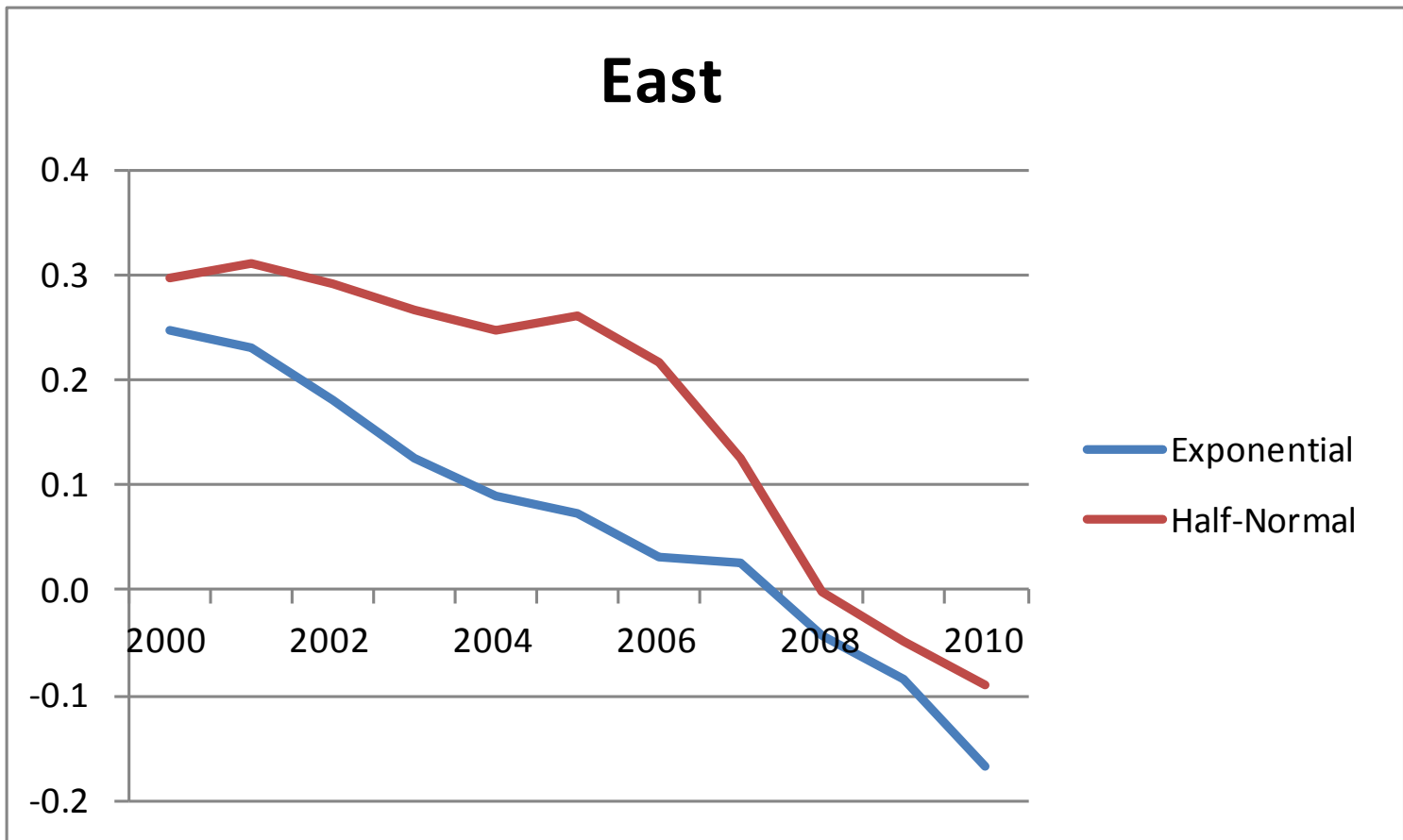
Case 3 accepted, holds for all years
 Implication: skewed distribution
 some firms constrained, others not

Result 1: increased emphasis on equity

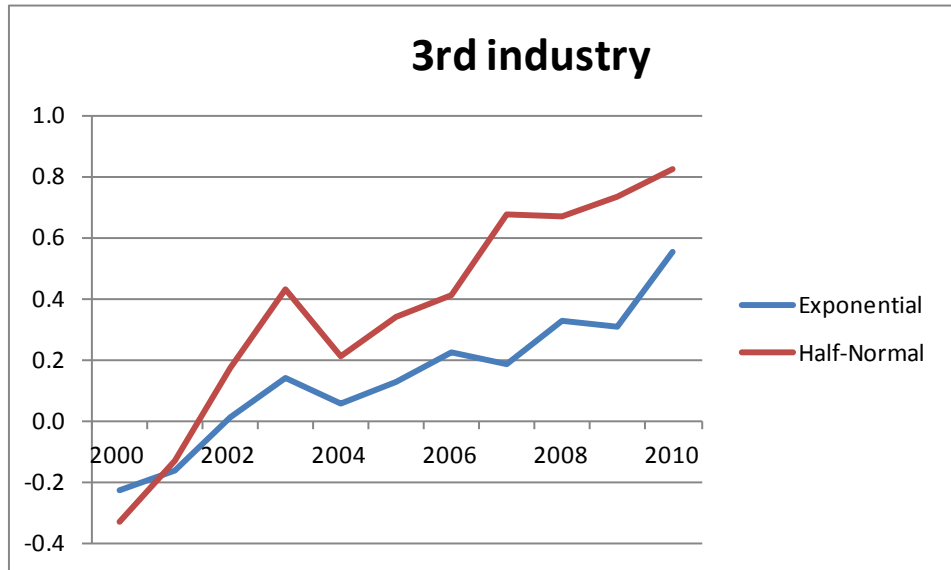


Result 2

Decreased emphasis on east

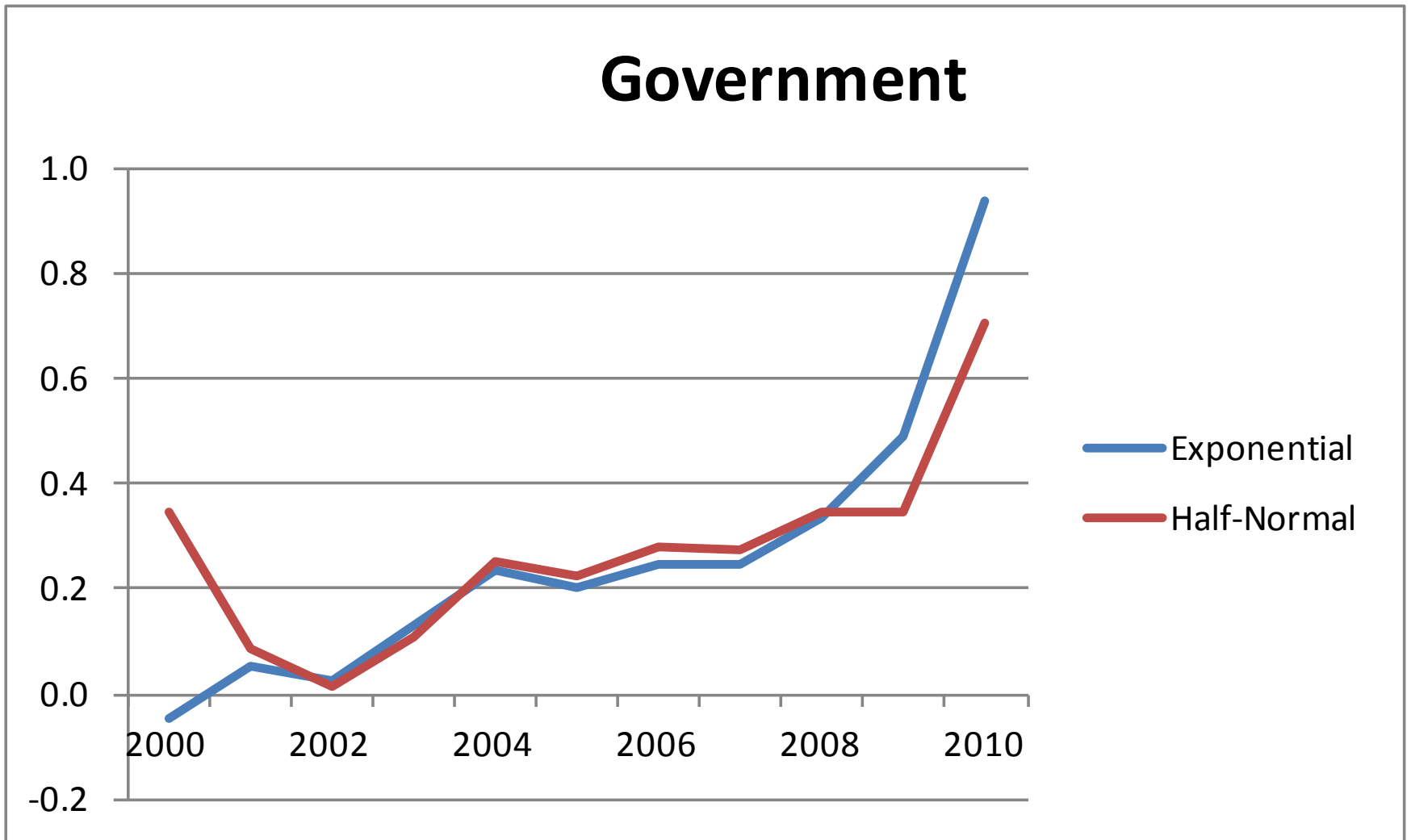


Result 3: Industry and services gain



Result 4

Public firms gain!



Discussion

- Work in progress
 - first preliminary draft available
- So far:
 - method applicable
 - results interesting
- Needs loads of robustness checks
 - alternative assumption about u
 - panel data analysis
- Writing still in preliminary stages